

What is claimed is:

1. A test system for testing wireless devices, comprising:

an RF combining component;

an adjustable attenuation component, in RF connection with said RF combining component;

a test node, in RF connection with said adjustable attenuation component, so that RF signals between said RF combining component and said test node pass through said adjustable attenuation component, and wherein said test node includes a device under test;

a controller component controlling said adjustable attenuation component, wherein said controller component causes said adjustable attenuation component to vary RF signal strength between said RF combining component and said test node.
2. The test system of Claim 1 wherein said RF combining component combines RF signals from a plurality of test nodes.
3. The test system of Claim 2 wherein said RF combining component includes disconnectable connection ports to allow additional test nodes to be connected to said RF combining component.
4. The test system of Claim 1 wherein said controller component maintains information for an emulated spatial position of said test node in an emulated wireless environment, and by causing said adjustable attenuation component to vary RF signal strength between said RF combining component and said test node, said controller component modifies said emulated spatial position of said test node in said emulated wireless environment.
5. The test system of Claim 4 wherein said RF combining component combines RF signals from a plurality of test nodes, and said controller component maintains information for an

emulated spatial position in said emulated wireless environment for each of said plurality of test nodes, said controller component, by causing said adjustable attenuation component to vary RF signal strength, changes said emulated spatial position of said test node including said device under test in said emulated wireless environment.

6. The test system of Claim 1 wherein said controller component emulates objects causing RF signal distortion in said emulated wireless environment through adjustment of said adjustable attenuation component.

7. The test system of Claim 1 wherein an RF interference signal is introduced into said test system.

8. The system of Claim 1 wherein said RF connection is provided by shielded cables.

9. The system of Claim 3 further including:

a graphical display component, in communication with said controller component, said graphical display component to show said emulated RF environment with test nodes depicted in spatial relation to each other as defined by said information for emulated spatial position for each test node.

10. A method for emulating an RF environment for wireless devices, comprising:
 - providing a plurality of connection nodes, wherein each connection node includes a shielded RF path, and wherein at least one connection node includes a wireless device;
 - combining RF signals from said shielded RF paths for said connection nodes;
 - attenuating at least one RF signal on one of said shielded RF paths, in order to emulate decreased signal strength within said emulated RF environment.
11. The method of Claim 10 wherein said emulated decreased signal strength within said emulated RF environment includes decreased signal strength caused by distance between connection nodes.
12. The method of Claim 10 further including:
 - maintaining information for an emulated spatial position for each of said connection nodes within said emulated RF environment; and
 - attenuating RF signals on said shielded RF paths in order to emulate distances between said connection nodes in said emulated RF environment that correspond to said emulated spatial positions for each of said connection nodes.
13. The method of Claim 12 further including:
 - changing an attenuation level of RF signals on said shielded RF paths in order to emulate a change in an emulated spatial position for one of said connection nodes within said emulated RF environment.
14. The method of Claim 10 further including:
 - injecting an RF signal into one of said shielded RF paths, in order to emulate interference in said emulated RF environment.

15. The method of Claim 10 further including:

distorting an RF signal on one of said shielded RF paths to emulate RF signals distorted by signal reflections in said emulated RF environment.

16. The method of Claim 12 further including:

providing a graphical display showing said emulated RF environment with communication nodes depicted in spatial relation to each other as defined by said information on spatial position for each of said communication nodes.

17. An RF module for testing an RF device under test in a test environment; said RF module comprising:

at least one isolation chamber, said isolation chamber including a connection port to connect to said RF device under test, said connection port including connections so that a connected RF device under test is in RF connection with an adjustable attenuation component, and wherein said adjustable attenuation component is in RF connection with an RF port on said RF module;

a controller, to control said connected RF device under test.

18. The RF module of Claim 17 wherein a connected RF device under test includes a second RF connection; and said connection port includes connections so that said second RF connection on a connected RF device under test is in RF connection to a second programmable attenuation component, said second programmable attenuation component in RF connection with said RF port through an RF combining component.

19. The RF module of Claim 17 wherein said RF port on said RF module allows interconnection to an RF combining component, said RF combining component to combine RF signals from other RF devices.

20. The RF module of Claim 19 wherein said RF port on said RF module is electrically connected to a DC signal detector, to detect DC signals emanating from other RF modules interconnected with said RF combining component.

21. The RF module of Claim 20 further including a DC signal injector electrically connected to said RF port on said RF module.

22. The RF module of Claim 17 wherein said RF isolation chamber contains [encloses?] RF signals emanating from said connected RF device under test.

23. The RF module of Claim 17 wherein said RF isolation chamber isolates said connected RF device under test from outside RF signals and noise.
24. The RF module of Claim 17 wherein said connection port includes RF isolation shielding to contain RF signals emanating from a connected RF device under test.
25. The RF module of Claim 17 further including a plurality of RF signal access locations to provide access to RF signals at each of said plurality of RF signal access locations.
26. The RF module of Claim 17 wherein said plurality of RF signal access locations allow injection of RF signals at said RF signal access locations.
27. The RF module of Claim 17 wherein said RF module receives a system synchronization signal for use in processing received data from said connected RF device under test.
28. The RF module of Claim 17 wherein said RF module is detachably mountable within an RF isolation chassis, wherein said RF port on said RF module connects to an RF combining component within said RF isolation chassis, said RF combining component combining RF signals from said RF module and at least one other RF device.

29. A test module, for use in a RF test environment, comprising:
- an RF port to connect to said RF test environment;
 - an adjustable attenuation component in RF connection with said RF port;
 - a modulator/demodulator component, in RF connection with said adjustable attenuation component;
 - a virtual client emulator, to emulate at least one virtual client that is transmitting RF signals in said RF test environment;
 - wherein said virtual client emulator is in communication with said modulator/demodulator component to allow said at least one virtual client to transmit RF signals into said RF test environment.
30. The test module of Claim 29, wherein said virtual client emulator includes:
- a receive filter and distributor (RFD) component, to process data frames received from said RF test environment; and
 - a transmit arbitrator component, to process and transmit data frames to said RF test environment.
31. The test module of claim 30 wherein said transmit arbitrator component creates data frames that are invalid in accordance with a selected protocol for said RF test environment.
32. The test module of claim 30 wherein said transmit arbitrator component creates data frames with incorrect checksums.
33. The test module of claim 29 wherein said transmit arbitrator component transmits a data frame at a time when another device is transmitting data in said RF test environment.

34. The test module of claim 29 wherein said adjustable attenuation component changes attenuation based on a selected virtual client transmitting RF signals into said RF test environment.
35. The test module of claim 29 wherein said adjustable attenuation component changes attenuation for certain data frames being transmitted into said RF test environment.
36. The test module of claim 29 wherein said test module receives data frames from a wired data packet network, and said test module transmits said received data frames in said RF test environment.
37. The test module of claim 29 wherein said test module is detachably mountable within an RF isolation chassis, wherein said RF port on said test module connects to an RF combining component within said RF isolation chassis, said RF combining component combining RF signals from said test module and at least one other RF device.
38. The test module of claim 37 and wherein said RF port is detachably connectable to an RF combining component, said RF combining component combining RF signals from said test module and at least one other RF device.

39. A method of emulating traffic in an RF test environment, comprising:
- providing a modulator/demodulator component, said modulator/demodulator component transmitting and receiving in said RF test environment;
 - creating a plurality of virtual clients in connection with said modulator/demodulator component, wherein said virtual clients transmit and receive data frames in said RF test environment through said modulator/demodulator component, and wherein said virtual clients each maintains information regarding such data frames.
40. The method of claim 39 wherein said virtual clients transmit and receive data frames in compliance with a selected wireless communications standard.
41. The method of claim 39 wherein when at least one virtual client is transmitting data frames into said RF test environment, a signal strength of an RF signal being transmitted from said modulator/demodulator component into said RF test environment is reduced.
42. The method of claim 39 further including providing transmission arbitration for said plurality of virtual clients.
43. The method of claim 39 further including transmitting in said RF test environment data that is invalid according to said communication protocol.
44. The method of claim 39 further including transmitting in said RF test environment data with invalid checksums.
45. The method of claim 42 wherein said transmission arbitration includes an ability to transmit at a time to create an on-air collision with another device transmitting in said wireless network.

46. The method of claim 39 wherein said modulator/demodulator component is in RF connection with an RF combining component, said RF combining component combining RF signals from a plurality of RF devices.